Plug & Play Bilge Control System

IOS 8849 and ISO 15083 Compliant

Introduction

The E-Plex 828BPM is a bilge pump control unit that operate locally to provide automatic 'hard wired' control of a bilge pump from up to two float switches. It also includes monitoring and control capabilities supported by E-Plex over it's two wire bus. It can work with pumps up to 20 amps continuous load and support single or double water detectors and hard wired switch inputs.

Quick and reliable install:

- Installation time reduced by one hour or more.
- Installation is de-skilled.
- Straight forward wired connections to dedicated terminals.

Increased reliability:

- Allows for simple programming of periodic pump exercising via E-Plex control.
- Integral current monitoring which can be used to detect blocked or seized pumps by E-Plex.
- Fewer connections increases reliability.
- Many levels of redundancy – both float switches will operate pump (with or without E-Plex active).

Hard wired signals and controls include:

- Active high (battery positive) "alarm output".
- Active low (switch to ground / battery negative) "manual pump run control"

Features to meet craft standards:

- Monitored supply status.
- Pump run indication.
- Alert output on high level.
- Remote manual override.

Simpler Stock Holding:

- Universal power input (9V – 32V) means one part to suit 12 and 24 volt systems.

E-Plex signals and contols include:

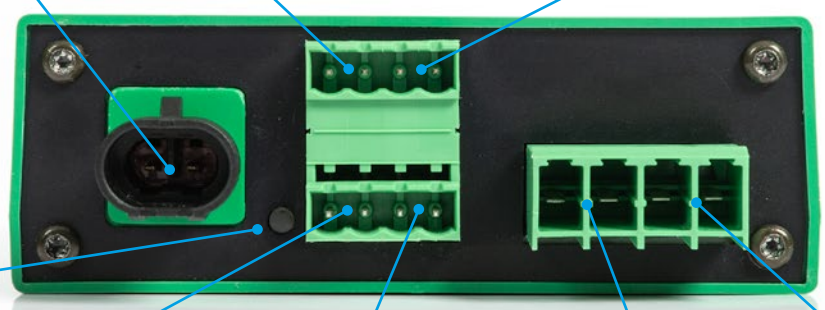
- Power supply available.
- Pump output active.
- Manual pump operation via E-Plex.
- Normal level float switch active.
- High level output float switch active.
- Pump current draw.

Featured Connections

EP3 Connector
Allows for connection of the E-Plex logic system

High Sensor Input
Allows for connection of a high level sensor to signal a warning when sensor is activated

Low Sensor Input
Allows for connection of a low level sensor to start pump when level is reached and to stop the pump when the level clears this sensor



Activity LED
Shows indication of E-Plex activity

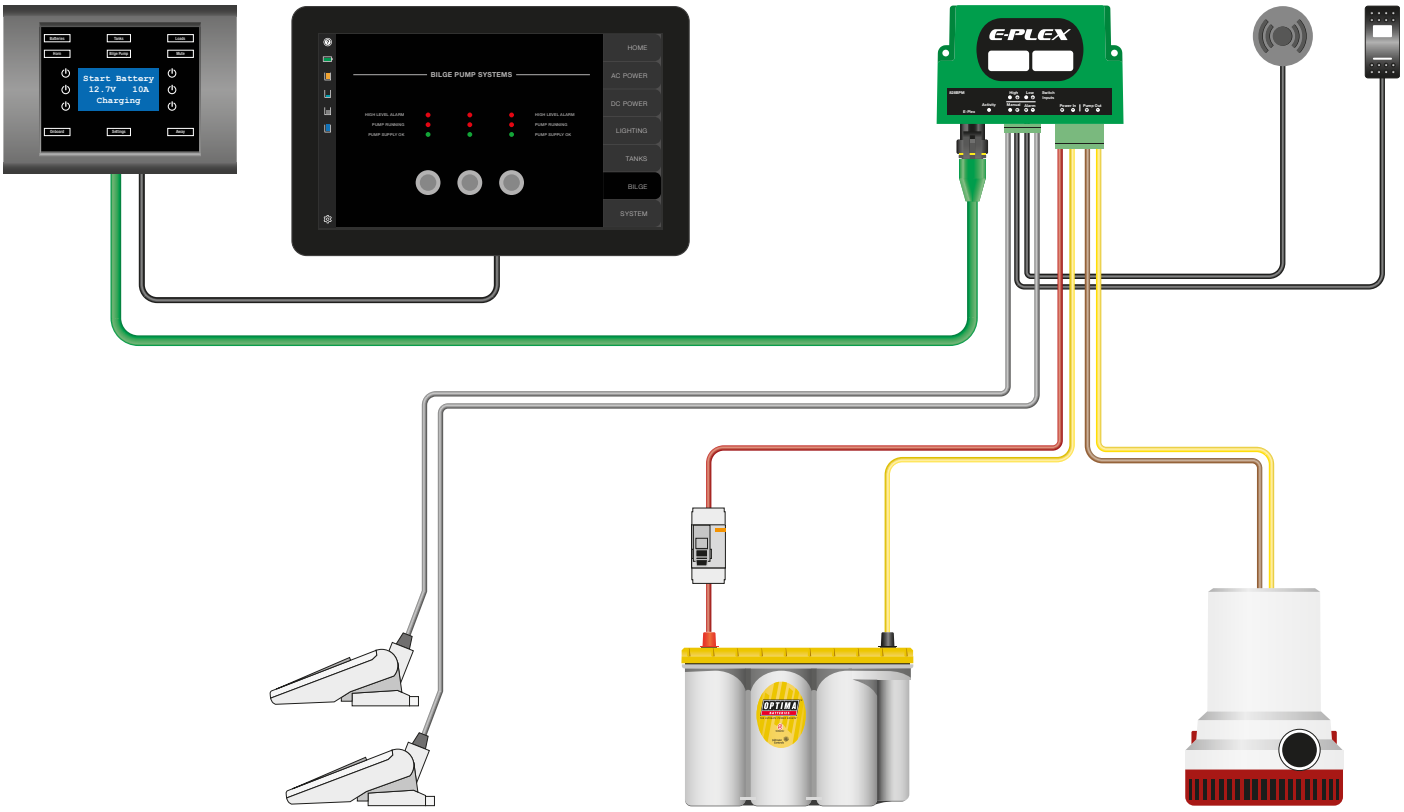
Manual Override Input
Allows for connection of a manual override switch

Ground & Alarm Signal Output
Allows for connection to an alert system or sounder

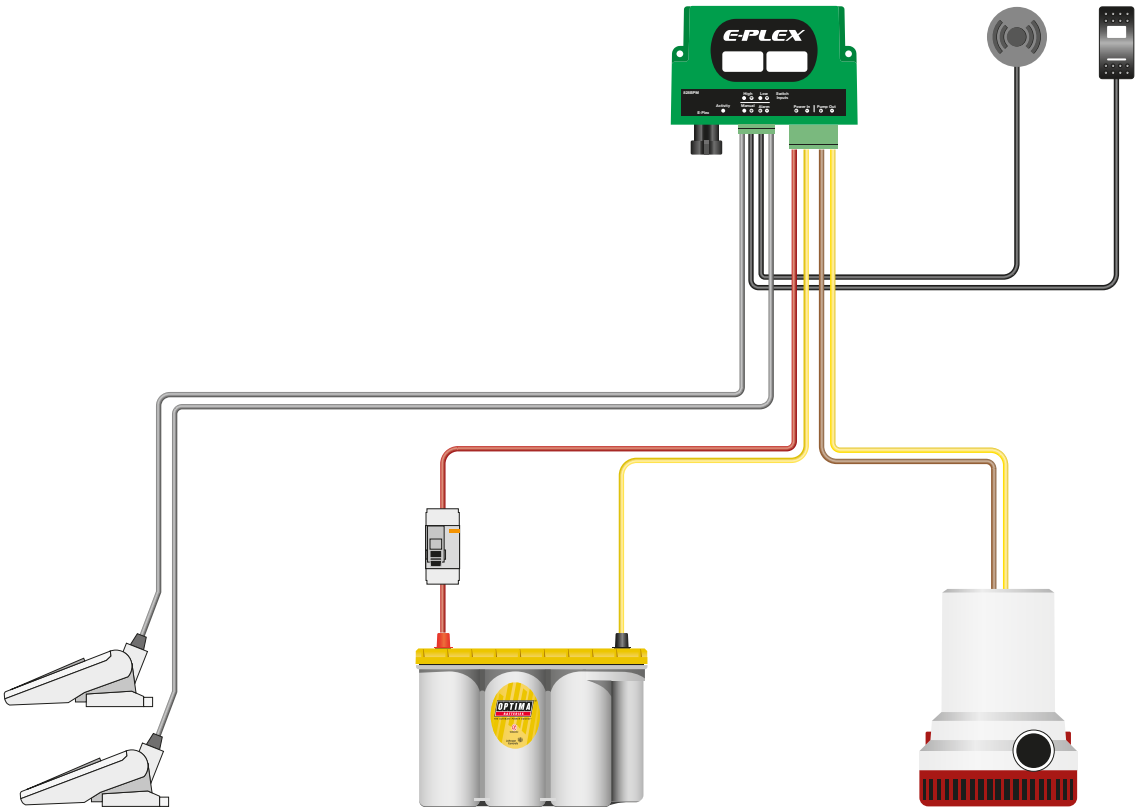
Power Input
Allows for connection of DC power in

Pump Output
Allows for connection to a bilge pump

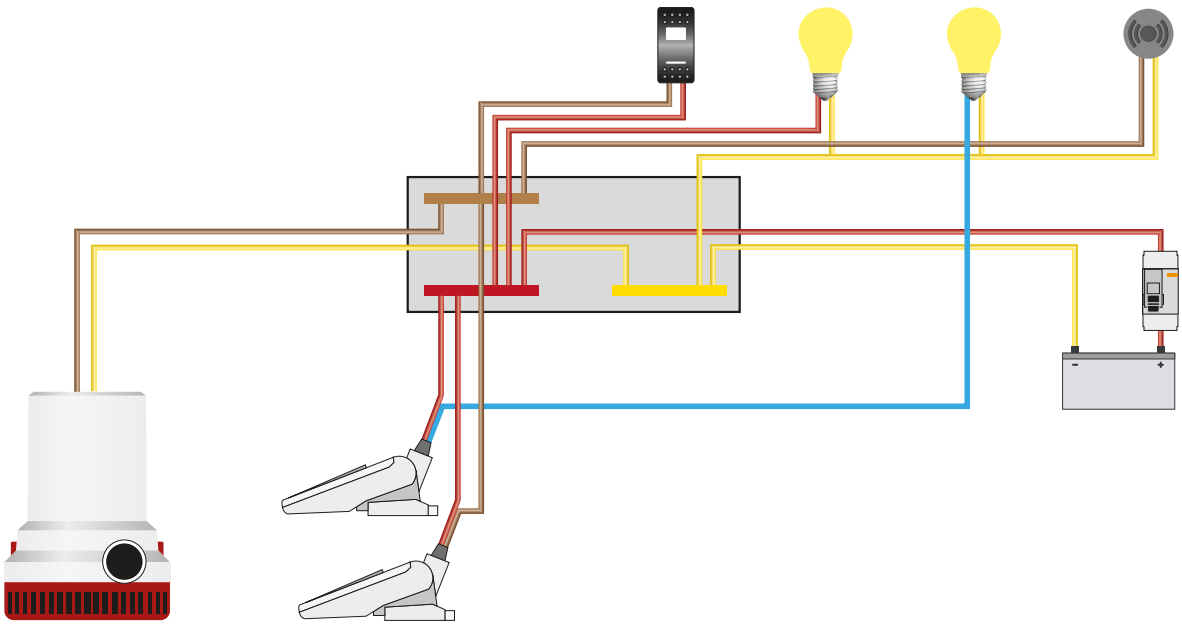
Standard System - With E-Plex monitoring



Standalone System - No E-Plex monitoring



Traditional System



Electrical Specifications

Operating Voltage	9-32V DC
Operating Current (module only)	5 mA
Low Input Threshold	(0.5-1.0V DC)
Hi Input Threshold	(4.6-32V DC)
Relay Contact Rating	32V DC @ 20Amps (Continuously Rated)[1]

[1] Please note: this must be protected by a suitable circuit breaker or fuse

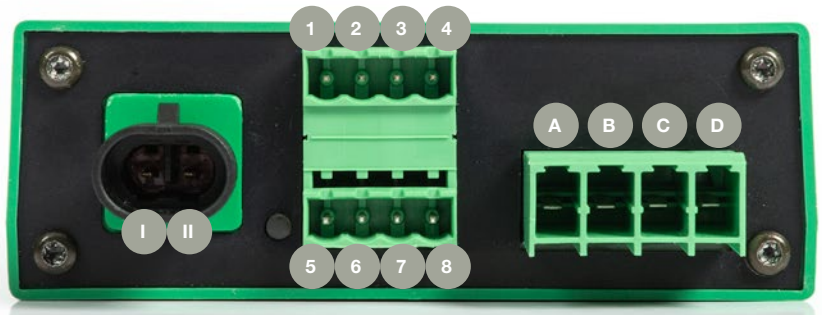
Terminal Connector Specifications

Connector Type - power and pump	Phoenix Contact 4 Way Screw Clamp Connector
Wire Gauge	0.2mm² (24AWG) Min to 4mm² (10AWG) Max
Wire Strip Length	5 – 7 mm (.19” - .27”)
Connector Type - float switches and controls	Phoenix Contact 8 Way Screw Clamp Connector
Wire Gauge	0.2mm² (24AWG) Min to 2.5mm² (12AWG) Max
Wire Strip Length	5 – 7 mm (.19” - .27”)
Communications Connectors Specifications	EP3

Physical Specifications

Front Bezel Material	Aluminum
Back Case Material	ABS
Operating Temperature	-5°C- 60°C (23°F - 140°F)
Storage Temperature	-30°C- 85°C (-22°F - 185°F)
Weight	200g (7.05oz)
Overall Length	118mm (4.64”)
Overall Height	41mm (1.61”)
Overall Depth (including Connectors)	95mm (3.74”)
Mounting Hole Size	M4

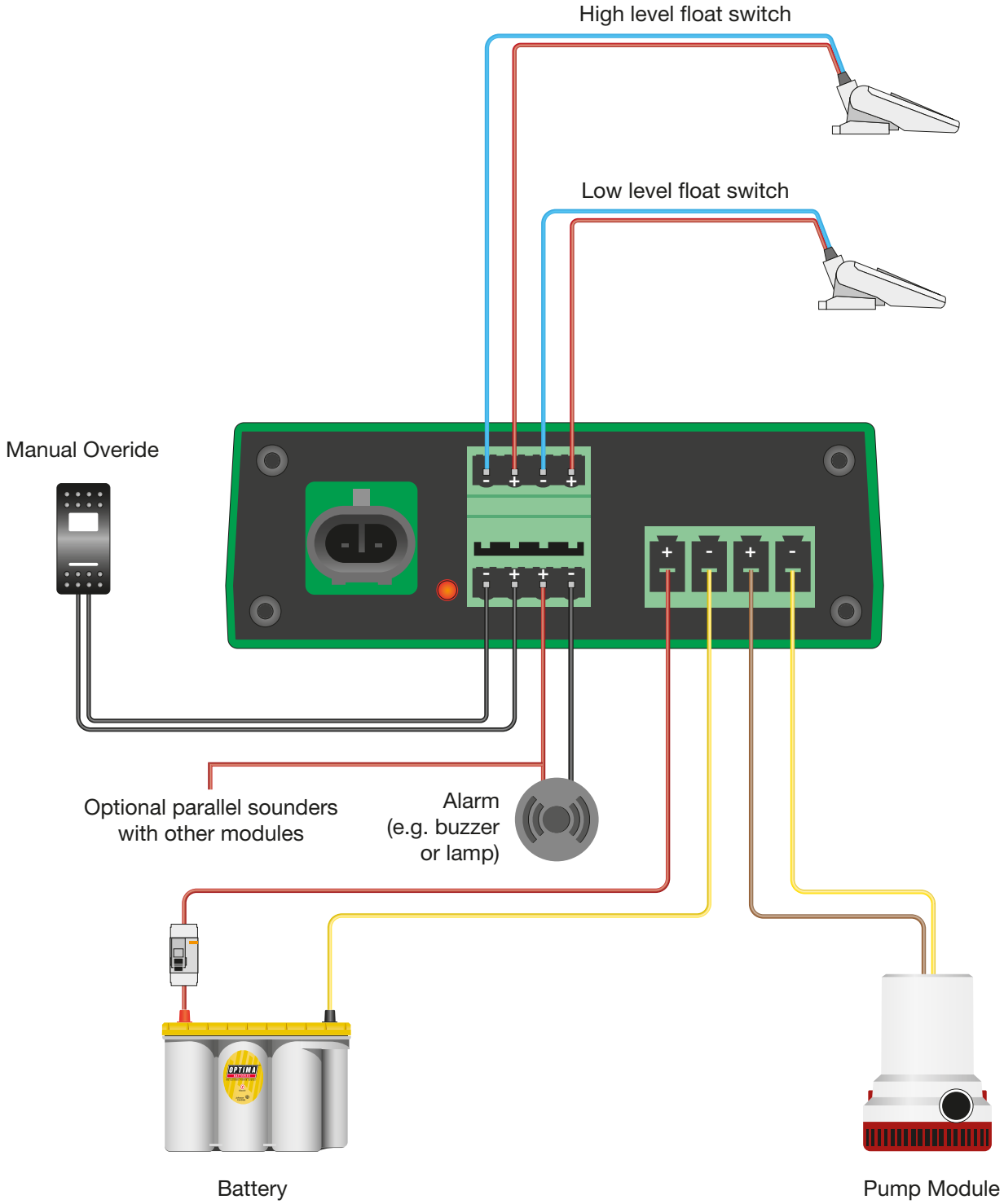
Connection & Wiring Diagram



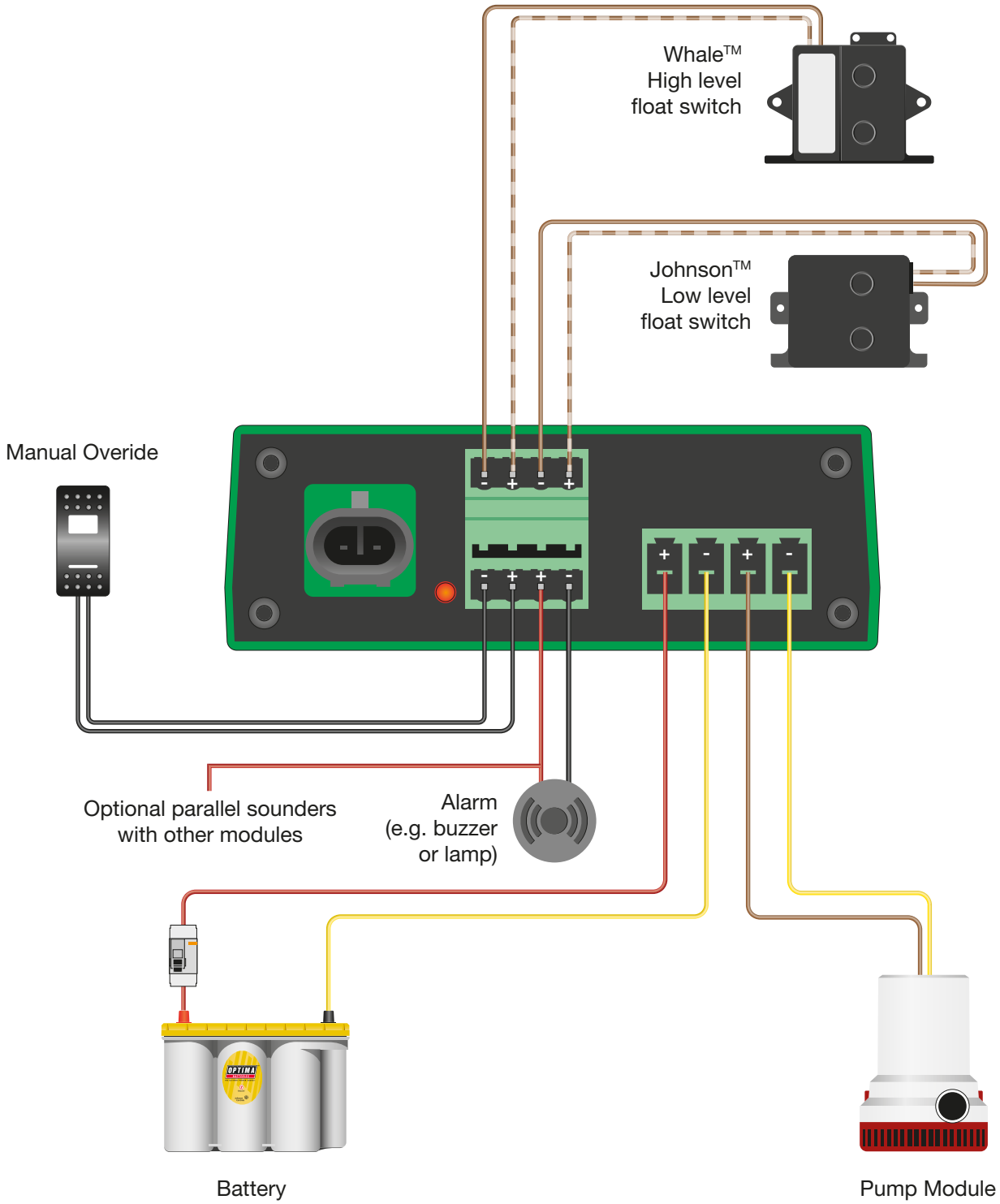
Connection	Specifications	In / Out	Remarks
A	+V Supply	I	0 -32V DC 0- 20A
B	0V Supply	I	
C	+V to Pump	O	0 -32V DC 0- 20A
D	0V to Pump	O	
1	High Sensor Supply	I	Supports electronic float switches (Whale™ and Johnson™) and standard float switches
2	High Sensor Return	I	
3	Low Sensor Supply	I	
4	Low Sensor Return	I	
5	Manual Override input -	I	Activated by pulling terminal 6 to ground or terminal 5
6	Manual Override input +	I	
7	Alarm Output	O	Active high with local ground - can be paralleled[1]
8	Ground / 0V	O	
I	E-Plex Bus +	I	Grey
II	E-Plex Bus -	I	Violet

[1] *Maximum 2 Amp overload protected*

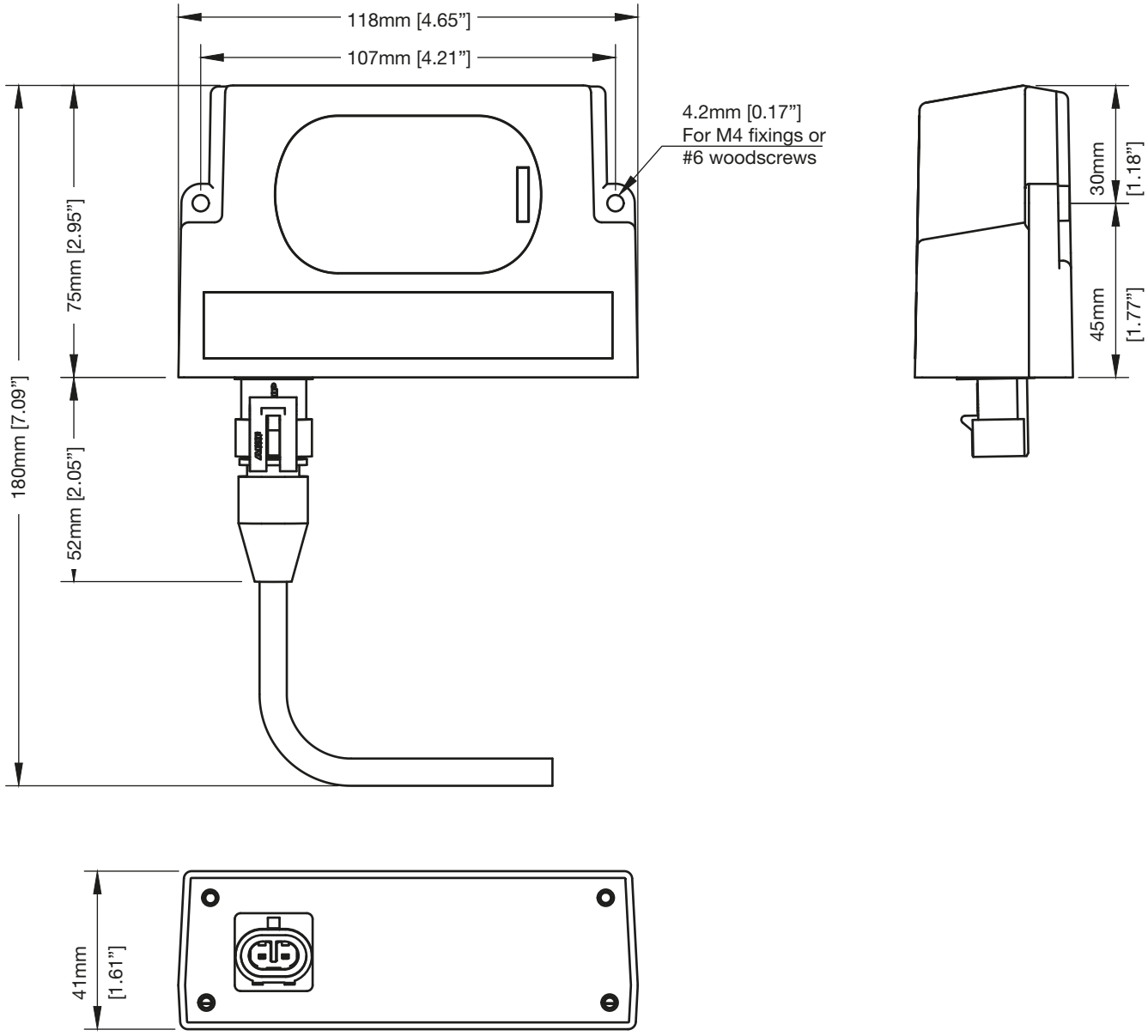
Module Connections Detailed - manual float switches



Module Connections Detailed - electronic float switches



Dimensional Diagram



Regulations

Electrically operated direct current bilge pumps: ISO 8849:2003
Small Craft Bilge Pumping systems: ISO 15083:2003
CE Marking
Marine Small Craft Directive: BS EN 28846:1993
EMC: Directive: BS EN 61000-6-3:2007+A1:2011
Low Voltage Directive: BS EN 60950-1:2006+A12:2011

Standards - RCD compliance

ISO 10133

2.4.6 All d.c. equipment shall be capable of function within a voltage range of 75 % to 133 % of nominal voltage at the battery terminals, eg:
-for a 12 V system: 9 to 16 V
-for a 24 V system: 18 to 32 V
-for a 48 V system: 36 to 64 V

EXCEPTION: Where the circuit includes equipment requiring a higher minimum voltage, the specified minimum voltage shall be used in the calculation of the conductor size. See Annex A.

2.4.7 The length and cross-sectional area of conductors in each circuit shall be such that the calculated voltage drop shall not exceed 10% of the nominal voltage.

NOTE: See Annex A for voltage drop calculations.

Circuits that typically require a 3% voltage drop include:

a) panel board/switchboard main conductors;
b) navigation lights;
c) bilge blowers;
d) bilge pumps; and
e) other equipment vital to safety or where voltage drop should be kept to a minimum as specified by their manufacturer.

ISO 15083

6 Design and construction

6.1 General

6.1.1 The design and construction of bilge-pumping systems shall withstand the pressures, temperatures and stresses likely to be encountered under normal operating conditions.

Bilge pumps shall be operable within temperature limits ranging from 0 °C to + 60 °C and shall withstand storage temperatures, without operation, of – 40 °C to + 60 °C when in the dry condition.

6.2 Electrically operated pumps

6.2.1 Electric bilge pumps shall comply with ISO 8849.

6.2.2 Electrical connections shall be water resistant to a degree of IP 67 according to IEC 60529, and shall be placed above the maximum acceptable water level, unless submersible.

6.2.3 Where the switch is subject to spray water, it shall be water resistant to a degree of IP 56 according to IEC 60529.

7 Installation

7.10 Automatic controls shall be provided with a visual indication showing that power is supplied to the pump and that the pump is set and ready to operate in automatic mode.

Standards - RCD compliance continued

ISO 8849

4 General requirements

4.1 Bilge pumps shall be designed to operate continuously at 87,5 % of nominal voltage, i.e. 10,5 V for a 12 V system, 21 V for a 24 V system, up to their design voltage at the point within the range of performance recommended for the pump that results in the highest power consumption

4.2 Bilge pumps and devices used to convert bilge pumps to automatic operation shall be ignition-protected in accordance with the requirements of ISO 8846 and shall meet the electrical requirements of ISO 10133.

4.4 Bilge pumps shall be provided with means of fastening them to the craft independently and securely.

4.5 Materials used in the construction of bilge pumps, which can be expected to come in contact with sea water, shall be
- selected or coated to be resistant to corrosion,
- galvanically compatible, and
- resistant to deterioration by bilge-cleaning agents and intermittent exposure to petrol (gasoline), oil and diesel fuel.

5 Electrical requirements

5.2 Conductors used for connection to the power supply shall be of stranded copper meeting the size, current capacity and insulation requirements of ISO 10133.

5.3 Submersible pumps shall have watertight electrical connections, IP 56 in accordance with IEC 60529. The use of a length of watertight electrical cable sealed at the pump connection is recommended, so that connections to the power supply may be made above the normal bilge-water level.

5.5 Bilge pumps shall be protected against continuously locked rotor conditions by
- integral overcurrent protection, or
- overcurrent protection in the circuit of a size to protect the bilge-pump motor, or
- being capable of sustaining operation with a locked rotor for 7 h without generating surface temperatures in excess of 150ºC, at an ambient temperature of 60 ºC, and without evidence of charring, burning or melting.

5.7 Bilge pumps designed for automatic operation shall be provided with an override switch to permit manual operation if the automatic operation fails.

6 Marking

Each bilge pump shall be marked as follows by a name-plate or other equally permanent means with at least the following information:*

- manufacturer’s name or identification;
- model and/or serial number;
- electrical rating in volts and amperes;
- ISO 8849;
- output rating at 10 kPa (1 m lift) (see 4.3).

* Not necessary for switch

Ordering Information

Description	Part Number
828BPM Bilge Pump Module	EP3-828BPM
Replacement Connector Power	CO-CONN-828BPM-PLUG1
Replacement Connector signals	CO-CONN-828BPM-PLUG2

E-PLEX

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